The Cosmic Inventor:

Reginald Aubrey Fessenden (1866–1932). Transactions of the American Philosophical Society, vol. 89, pt. 6. Philadelphia, PA: American Philosophical Society, 1999.

One of the most important and overlooked pioneers in early wireless technology was the Canadian, Reginald Fessenden. He, before any other person, realized that in order to achieve wireless telephony, the damped wave of the spark gap had to be replaced with the continuous wave that has since dominated radiocommunications for nearly a century.

On Christmas Eve, 1906, Fessenden, using a revolutionary high-frequency alternator, aired the first radio broadcast in history from his Brant Rock station in Massachusetts, and afterwards received letters from listeners as distant as the Caribbean Sea. Despite the fact that he essentially invented amplitude-modulation radio, Fessenden, compared with his contemporaries Guglielmo Marconi and Lee De Forest, has not received his fair share of recognition for his accomplishments in wireless. Moreover, Fessenden was an eclectic inventor who claimed scores of patents in fields outside wireless, including several related to the first acoustic depth sounder. Though Frederick Seitz's slender (83 pages, including a table of contents), chronologically-organized biography somewhat compensates for this neglect, *Cosmic Inventor* is excessively flawed, chiefly because of the author's failure to weigh sources of uneven quality with sufficient caution.

Seitz's regrettable method is to introduce a source uncritically and rarely mention it again. This makes evaluating any source's credibility — and hence almost anything Seitz says — impossible for readers not already familiar with Reginald Fessenden. But Fessenden devotees will recognize the author's lack of discrimination when it comes to appraising what goes into this book. For instance, *Cosmic Inventor* tells us that Ormond Raby's *Radio's First Voice* (1970) [6], is "a popular novel that contains a continuous flow of imagined but plausible incidents involving conversation and action.(p. 7)" Plausible or not, Raby wrote *Radio's First Voice* as a children's novel, and Seitz's characterization of it as "a particularly useful" — rather than an exceptionally unreliable — source of historical evidence is preposterous (p. 4). Unfortunately, Seitz probably acquired from Raby (whose many fabrications includes, typically, a young Reginald Fessenden visiting Alexander Graham Bell) the fictitious assertion that Fessenden and his wife were "close, lifetime friends with the Wright brothers," a tempting exaggeration that even Fessenden's widow, a consummate name-dropper, successfully resisted. Since Seitz never mentions Raby after page 7, one can only speculate how deeply Raby's influence penetrates. On the other hand, credible sources are treated the with the same respect as fictional ones. Seitz describes Fessenden's archived papers as "particularly rich with respect to patents, published and unpublished papers, correspondence, and photographs." Moreover, adds Seitz, who is nothing if not a gentleman, "the [archive's] staff is highly cooperative" (p. 7). I concur with these statements, but determining what from the Fessenden papers — besides a few photographs — actually went into this book is futile. Incredibly, Seitz never mentions three fine historians whose published works might have enhanced the credibility of *Cosmic Inventor*: Hugh G.J. Aiken, Susan Douglas, and William McBride [1]-[3], who wrote the only objective history of the Fessenden turbo-electric drive. My guess is that Seitz drew especially heavily from a much earlier, limited, and far more celebratory literature, especially the biography that Fessenden's widow published in 1940 [4], and Fessenden's partial memoirs, which Seitz neglects to state were published in 1925 [5].

Not that *Cosmic Inventor* is without merit. The author deserves credit for translating much of Mrs. Fessenden's anguished prose into a more easily read form. Furthermore, he reveals Reginald Fessenden's eclectic accomplishments in fields outside his already widely known career in wireless. Among Fessenden's less renowned but notable inventions include fire-resistant electrical insulation, an early form of microfilm, and an electromechanical transducer that foreshadowed sonar and acoustic depth finders. He even ventured, with less felicitous results, into archeology and philology. Finally, at one point, Seitz, an eminent scientist in his own right who helped found the field of solid-state physics, takes unique advantage of his long and distinguished career. In World War I, an attempt on the part of General Electric, Western Electric, and Fessenden's employer to collaborate on the development of antisubmarine detectors degenerated into acrimony. Seitz softly rebuts Fessenden's accusations of obstructionism against GE and Western Electric by recalling that in the 1930s "I came to know Willis Whitney [the director of the GE R&D laboratory during the war].… It is difficult to believe that he was an obstructionist." Similarly, another GE employee who worked with Fessenden once told Seitz that

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"counterproductive barriers were set up between" Fessenden's company, GE, and Western Electric (p. 48). I have used documents from Fessenden's papers to argue similar points elsewhere, and however unconventional, Seitz's unique use of oral history in this case is appropriate.

Purchase or borrow this book only if you seek a short biography of Reginald Fessenden. But *Cosmic Inventor* is not a good book; read it and you risk falling victim to its unpredictable fallibility.

—Gary Frost

References

[1] H.G.J. Aitken, *The Continuous Wave: Technology and American Radio, 1900–1932.* Princeton, NJ: Princeton Univ. Press, 1985.

[2] S.J. Douglas, *Inventing American Broadcasting, 1899–1922*. Baltimore, MD: Johns Hopkins, 1987.

[3] W.M. McBride, "Strategic determinism in technology selection: The electric battleship and U.S. naval-industrial relations," *Technology and Culture,* vol. 33, pp. 248-277, 1992.

[4] H. Fessenden, *Fessenden: Builder of Tomorrows.* New York, NY: Coward-McCann, 1940.

[5] R.A. Fessenden, "The inventions of Reginald Fessenden," parts 1–11, *Radio News*, Jan.-Nov. 1925.

[6] O. Raby, *Radio's First Voice: The Story of Reginald Fessenden*. Toronto,Ont.: MacMillan, 1970.

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